

REMARKS

The Applicant thanks the Examiner for the thorough consideration given the present application. Claims 1-19 are pending, and none has been amended. Claims 1, 16, and 18 are independent. The Examiner is respectfully requested to reconsider the rejections in view of the remarks set forth herein.

Request for Reconsideration / Reasons for Entry of Amendments

First of all, the Applicants respectfully submit that at least **independent claims 1 and 16** (and the claims depending therefrom) as previously presented are in condition for allowance, and that the Restriction Requirement and the new combinations of references cited in the latest Office Action to reject these claims are not proper and should be withdrawn. (See arguments below.)

By way of this Reply, each of claims 1-19 remains as previously presented.

It is respectfully requested that this Reply be entered into the Official File in view of the fact that the pending claims automatically place the application in condition for allowance.

Further, all of the subject matter now set forth in each of the pending claims has been fully considered and examined by the Examiner. As such, the pending claims do not raise any new issues that would warrant or require the Examiner to perform an additional search of the related art.

In the alternative, if the Examiner does not agree that this application is in condition for allowance, it is respectfully requested that this Reply be entered for the purpose of appeal. This Reply was not presented at an earlier date in view of the fact that the Examiner has just now presented new grounds for rejection in this Final Office Action.

Examiner Interview

If, during further examination of the present application, any further discussion with the Applicant's Representative would advance the prosecution of the present application, the Examiner is encouraged to contact Carl T. Thomsen, at 703-208-4030 (direct line) at his convenience.

Restriction Requirement

The Examiner has made the initial Restriction Requirement final, and has withdrawn claims 8-14 from further consideration. Inasmuch as claim 8-14 depend directly or indirectly from independent claim 1, it is respectfully requested that the Examiner rejoin and allow claims 8-14 upon allowance of independent claim 1.

The Examiner has made another Restriction Requirement in the latest Office Action, and has withdrawn claims 16-19 from further consideration, asserting that they are directed to inventions other than that originally claimed. This latest Restriction Requirement is traversed.

The Applicants respectfully submit that a serious burden has not been placed on the Examiner to consider all of the claims in a single application. Nowhere has the Examiner demonstrated that claims 16-19 are classified differently than claims 1-7 and 15. Thus, the Examiner has not demonstrated that a serious burden has not been placed on the Examiner. The Examiner is respectfully requested to reconsider his restriction and act on all of the claims in the present application. However, the Applicant respectfully submits that the combination of elements set forth in each of **independent claim 1** and **independent claim 16** are not different inventions.

Independent claim 1 recites "the micro-antenna has a flat meandering shape with plural turns extending in alternating directions," and **independent claim 16** recites "the micro-antenna has a flat undulating shape with plural turns." Both are illustrated in each of FIGS. 1(a) to 2(d) and 4 of the present application.

According to the "*Encarta World English Dictionary*" meandering and undulating are defined as follows:

Meandering:

1. **follow twisting route:** to follow an indirect route or course, especially one with a series of twists and turns

"The river meanders to the sea."

2. **wander slowly and aimlessly:** to move in a leisurely way,
especially for pleasure or because of a lack of motivation

"meandering through the park"

<http://www.bing.com/search?q=meandering&src=IE-SearchBox>

Undulating:

1. *transitive and intransitive verb* **move sinuously like waves:** to
move in waves or in a movement resembling waves, or cause something
to move in this way

2. *intransitive verb* **go up and down gracefully:** to rise and fall
gracefully in volume or pitch

<http://www.bing.com/Dictionary/search?q=undulate&FORM=DTP>

DIA

Given the common meanings of meandering and undulating above, the Applicant respectfully submits that

"the micro-antenna has a flat meandering shape with plural turns extending in alternating directions," as set forth in **independent claim 1**, and "the micro-antenna has a flat undulating shape with plural turns," as set forth in **independent claim 16** are not patentably distinct inventions.

Further, the subject matter of **independent claim 18** was previously set forth in independent claim 1 and dependent claim 5 which depends from independent claim 1.

Further, the Examiner has not shown that a serious burden has not been placed on the Examiner to consider all of the claims in a single application. Thus, the Applicant submits that the Examiner's latest Restriction Requirement is not proper and should be withdrawn.

If the Examiner continues to insist that this latest Restriction Requirement is proper, he is respectfully requested to provide specific support to justify his restriction.

Rejections Under 35 U.S.C. §102(a) and §103(a)

Claims 1-3, 5-7, and 15 stand rejected under 35 U.S.C. §102(a) as being anticipated by Ichiki et al., Plasma Sources Science and Technology, Published September 2003; and

Claim 4 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Ichiki et al., Plasma Sources Science and Technology, Published September 2003.

These rejections are respectfully traversed.

Declaration Under 37 CFR 1.132

The Applicant has attached a Declaration under 37 CFR §1.132 stating that the Applicant is one of the co-authors of Ichiki et al., Plasma Sources Science and Technology, Published September 2003, which is cited by the Examiner to reject the subject matter of claims 1-7 and 15 under 35 U.S.C. §102(a) and §103(a). The Declaration further states that the Applicant is the sole inventor of the invention set forth in U.S. Application No. 10/590,969, and that the others were merely working under his direction. Thus, the rejections under 35 U.S.C. §102(a) and §103(a) has been overcome.

Rejections Under 35 U.S.C. §103(a)

Claims 1-4 and 7 stand rejected under 35 U.S.C. §103(a) as being unpatentable over JP 2002-257785 in view of Yin et al., IEEE, 1999; and

claims 5 and 6 stand rejected under 35 U.S.C. §103(a) as being unpatentable over JP 2002-257785 in view of Yin et al., IEEE, 1999, and further in view of Mosheli (U.S. 2001/0047760).

These rejections are respectfully traversed.

Arguments Regarding Independent Claims 1, 16, and 18 as Previously Presented

independent claim 1 as previously presented recites a combination of elements directed to a microplasma jet generator, including *inter alia*

“wherein the micro-antenna has a flat meandering shape with plural turns extending in alternating directions.”

Independent claim 16 as previously presented recites a combination of elements directed to a microplasma jet generator, including *inter alia*

“wherein the micro-antenna has a flat undulating shape with plural turns.”

Independent claim 18 as previously presented recites a combination of elements directed to a microplasma jet generator, including *inter alia*

“wherein the substrate is made of one selected from the group consisting of sapphire, aluminum nitride, silicon nitride, boron nitride, and silicon carbide.”

The Applicant respectfully submits that the combination of elements as set forth in each of **independent claims 1, 16, and 18** is not disclosed or made obvious by any combination of the prior art of record, including **JP 2002-257785, Yin et al., IEEE, 1999, and Mosheli.**

The Examiner alleges that **JP 2002-257785** discloses a flat meandering shape with one turn. The Applicant respectfully disagrees.

As can be seen in the English translation of paragraph [0016] of **JP 2002-257785** below, this document merely discloses “one-roll monotonous type antenna (3) with an inside diameter of 2 mm ...”

[0016] ... Then, invention of this application is taken as the inductive-coupling microplasma source part by VHF drive. For example, drawing 1 is a partial composition photograph of the flat surface which showed the example. For example, it can be considered as the discharge tube capillary tube (2) whose width and depth are 1-5 mm, and copper plating and a microplasma chip with an one-roll monotonous type antenna (3) with an inside diameter of 2 mm produced by photo lithography in the center of a chip (1) made from quartz of 30 mm squares.

Further, as can be seen in FIG. 1 of **JP 2002-257785**, antenna (3) has a U-shape with parallel sides having equal lengths.

The Applicant respectfully submits that the “one-roll monotonous type antenna (3) with an inside diameter of 2 mm,” and having a U-shape with parallel sides having equal lengths as disclosed in **JP 2002-257785**, does not teach or suggest either:

“a flat meandering shape with plural turns extending in alternating directions,” as set forth in **independent claim 1**, or

“wherein the micro-antenna has a flat undulating shape with plural turns,” as set forth in **independent claim 16**.

As can be seen in **Yin et al.**, this document merely discloses helical and spiral coils. See, for example,

- page 516, II Experiment, A. which merely discloses “a 20-turn coil wound around a 6mm Pyrex tube, and
- pages 1517 to 1518, Experiment B and C, Table 1, and FIGS. 2 and 3 which merely disclose spiral coils.

According to the “*Encarta World English Dictionary*,” spiral is defined as follows:

Spiral:

1. **continuous circling flat curve:** in mathematics, a flat curve or series of curves that constantly increase or decrease in size in circling around a central point.

<http://www.bing.com/search?q=spiral+encarta&src=IE-SearchBox>

Further, the “*Oxford Advance Learner’s Dictionary*,” defines spiral as:

Spiral:

a continuous curved line that winds around a central point, with each curve further away from the centre.”

Given the differences between the common meanings of “meandering and undulating,” and the common meaning of “spiral,” the Applicant respectfully submits that

Thus, no combination of **JP 2002-257785**, **Yin et al.**, **IEEE, 1999**, and **Mosheli** (which merely disclose a U-shaped coil and spiral coils) cannot be combined to teach or suggest:

“wherein the micro-antenna has a flat meandering shape with plural turns extending in alternating directions” (as in **independent claim 1**),

“wherein the micro-antenna has a flat undulating shape with plural turns” (as in **independent claim 16**), or

“wherein the substrate is made of one selected from the group consisting of sapphire, aluminum nitride, silicon nitride, boron nitride, and silicon carbide” (as in **independent claim 18**).

As the Examiner knows well, a *prima facie* case of obviousness must be established in order for a rejection under 35 U.S.C. 103(a) to be proper.

M.P.E.P. section 2143 sets forth examples of basic requirements of a *prima facie* case of obviousness:

“The Supreme Court in *KSR International Co. v. Teleflex Inc.*, 550 U.S. ___, ___, 82 USPQ2d 1385, 1395-97 (2007) identified a number of rationales to support a conclusion of obviousness which are consistent with the proper “functional approach” to the determination of obviousness as laid down in *Graham*. The key to supporting any rejection under 35 U.S.C. **103** is the clear articulation of the reason(s) why the claimed invention would have been obvious. The Supreme Court in *KSR* noted that the analysis supporting a rejection under 35 U.S.C. **103** should be made explicit.”

One of the exemplary rationales that may support a conclusion of obviousness in accordance with the *KSR* decision is set forth in M.P.E.P. 2143 (C). This exemplary rationale relates to “use of known technique to improve similar devices (methods, or products) in the same way.”

Referring to M.P.E.P. 2143 (C), the following is stated:

“To reject a claim based on this rationale, Office personnel must resolve the *Graham* factual inquiries. Then, Office personnel must articulate the following:

(1) a finding that the prior art contained a “base” device (method, or product) upon which the claimed invention can be seen as an “improvement;”

(2) a finding that the prior art contained a “comparable” device (method, or product that is not the same as the base device) that has been improved in the same way as the claimed invention;

(3) a finding that one of ordinary skill in the art could have applied the known “improvement” technique in the same way to the “base” device (method, or product) and the results would have been predictable to one of ordinary skill in the art; and

(4) whatever additional findings based on the *Graham* factual inquiries may be necessary, in view of the facts of the case under consideration, to explain a conclusion of obviousness.

The rationale to support a conclusion that the claim would have been obvious is that a method of enhancing a particular class of devices (methods, or products) has been made part of the ordinary capabilities of one skilled in the art based upon the teaching of such improvement in other situations. One of ordinary skill in the art would have been capable of applying this known method of enhancement to a “base” device (method, or product) in the prior art and the results would have been predictable to one of ordinary skill in the art. The Supreme Court in *KSR* noted that if the actual application of the technique would have been beyond the skill of one of ordinary skill in the art, then using the technique would not have been obvious. *KSR*, 550 U.S. at ___, 82 USPQ2d at 1396. If any of these findings cannot be made, then this rationale cannot be used to support a conclusion that the claim would have been obvious to one of ordinary skill in the art.” (emphasis added)

Regarding **item (1)** above, the Examiner appears to consider JP 2002-257785 as representing the prior art containing a “base” device upon which the claimed invention can be seen as an “improvement.”

As discussed, JP 2002-257785 merely discloses an antenna (3) having a single turn to form a U-shape with parallel sides having equal lengths.

Regarding **item (2)** above, the Examiner appears to consider Yin et al. as representing the prior art containing a “comparable” device that has been improved in the same way as the claimed invention.

However, the Yin et al. reference merely discloses spiral and helical antennas.

The Applicant respectfully submits that the Examiner has failed to articulate at least **items (1) and (2)** above as is required.

Certainly, the Examiner cannot reasonably argue that a “spiral shape” is “comparable” to either a “meandering shape with plural turns in alternating directions,” or an “undulating shape.”

In view of the above, the Applicant respectfully submits that the Examiner has failed to establish a *prima facie* case of obviousness.

At least for the reasons explained above, the Applicant respectfully submits that the combination of elements as set forth in each of **independent claims 1, 16, and 18** is not disclosed or made obvious by any combination of the prior art of record, including **JP 2002-257785, Yin et al., IEEE, 1999, and Mosheli.**

Therefore, **independent claims 1, 16, and 18** are in condition for allowance.

Dependent Claims

All dependent claims are in condition for allowance due to their dependency from allowable independent claims, or due to the additional novel features set forth therein.

For example, each of **dependent claims 15, 17, and 19** recites

“wherein the plural turns extend up and down or back and forth with respect to an edge of the substrate.” See FIGS. 1(a) to 2(d) and 4 of the present application for support.

By contrast, the Yin et al. document merely discloses a micro-antenna formed with
a continuous circling flat curve: in mathematics, a flat curve or series of
curves that constantly increase or decrease in size in circling around a
central point.

Therefore, **dependent claims 15, 17, and 19** should be allowable.

All pending claims are now in condition for allowance.

Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. §102(a) and
103(a) are respectfully requested.

CONCLUSION

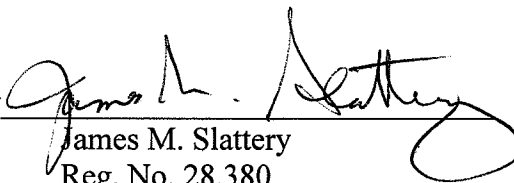
All of the stated grounds of rejection have been properly traversed, accommodated, or
rendered moot. It is believed that a full and complete response has been made to the outstanding
Office Action, and that the present application is in condition for allowance.

If the Examiner believes, for any reason, that personal communication will expedite
prosecution of this application, he is invited to telephone Carl T. Thomsen (Reg. No. 50,786) at
(703) 208-4030 (direct line).

If necessary, the Commissioner is hereby authorized in this, concurrent, and future
replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any
additional fees required under 37 C.F.R. §§1.16 or 1.17, particularly extension of time fees.

Respectfully submitted,

Date: April 1, 2011

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Attachment: Declaration under 37 CFR 1.132